NDU

MAT 235

Ordinary Differential Equations

Exam # 1

Duration: 55 minutes

Name: _____

Section: _____

Instructor: _____

Grade: _____

1) **(15 points)** Solve the D.E $\tan y dx + \tan x dy = 0$.

2) **(20 points)** Solve the initial value problem $\left(x - y^2\right)dx + 2xydy = 0$ with $y(1) = 0$.

3) **(15 points)** Solve the D.E $(1+xy)\frac{dy}{dx}+y^2=1$.

4) **(15 points)** Solve the D.E $\left(3x^2y^4+2xy\right)dx+\left(2x^3y^3-x^2\right)dy=0$.

5) **(15 points)** Given that $y = e^x$ is a solution of $xy'' - (x+1)y' + y = 0$, find the general solution of this equation. What is the particular solution with $y(1) = 0$ and $y'(1) = 0$?

6) **(20 points)** Find the orthogonal trajectories of the family of curves $y^2 - x^2 - cy = 0$.